WOLF CREEK
NUCLEAR OPERATING CORPORATION

Matthew W. Sunseri
Vice President Operations and Plant Manager

May 13, 2008

WO 08-0013

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

Subject: Docket No. 50-482: Licensee Event Report 2008-003-00, Manual Reactor Trip due to loss of Steam Generator Level

Gentlemen,

The enclosed Licensee Event Report (LER) 2008-003-00 is being submitted pursuant to 10 CFR 50.73(a)(2)(iv)(A) regarding a manual reactor trip at Wolf Creek Generating Station.

This letter contains no commitments. If you have any questions concerning this matter, please contact me at (620) 364-4008, or Mr. Richard D. Flannigan, Manager Regulatory Affairs at (620) 364-4117.

Sincerely,

M W Sunseri

Matthew W. Sunseri

MWS/rlt

Enclosure

cc: E. E. Collins (NRC), w/e
V. G. Gaddy (NRC), w/e
B. K. Singal (NRC), w/e
Senior Resident Inspector (NRC), w/e

IE22
NRR

NRC FORM 366 (6-2004) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 06/30/2007

Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
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4. TITLE

Manual Reactor Trip due to loss of Steam Generator Level

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
										05000
03	17	2008	2008	- 003 -	00	05	13	2008	FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE

1

10. POWER LEVEL

100

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: *(Check all that apply)*

- ☐ 20.2201(b)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☐ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☑ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☐ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER

Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER *(Include Area Code)*
Richard D Flannigan, Manager Regulatory Affairs	(620) 364-4117

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
A	EA	XFMR	G080	Y					

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ◉ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On March 17, 2008, at approximately 1:00 PM while operating at 100% power, Wolf Creek Generating Station (WCGS) was manually tripped due to loss of steam generator (S/G) level. 4.16-kV busses PB03 and PB04 were cross-tied and being supplied by transformer XPB03. A secondary power cable from transformer XPB03 faulted to ground causing loss of power to all condensate pumps that tripped the main feedwater pump on low suction.

The direct cause of the faulted transformer was human error. During previous maintenance the transformer bushing multi-conductor connector was reassembled improperly resulting in a loose connection. Together with the loose connection, the higher current caused by the cross-tied busses overheated the individual conductors and insulation resulting in a fault to ground.

The safety significance of this event is low. This event is bounded by the current licensing basis analyses as reported in WCGS Updated Safety Analysis Report (USAR) section 15.2.7, "Loss of Normal Feedwater Flow." All safety related equipment performed as expected. There were no adverse effects on the health and safety of the public.

LICENSEE EVENT REPORT (LER)

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17. NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)*

PLANT CONDITIONS PRIOR TO EVENT:

MODE – 1
Power – 100
Normal Operating Temperature and Pressure

BACKGROUND INFORMATION

The 4.16 KV station service buses PB03 and PB04 [EIIS Code: EA-BU] provide power to auxiliary plant loads such as the Heater Drain Pumps [EIIS Code: SM-P], Condensate Pumps [EIIS Code: SD-P], Central Chiller Compressors [EIIS Code: KM-CMP], Startup Feed Pump [EIIS Code: SJ-P], and the Normal Charging Pump [EIIS Code: CB-P]. The station service buses normally receive power from the 13.8 KV service buses through their respective station service transformers, XPB03 and XPB04 [EIIS Code: EA-XFMR]. The bus-tie breaker between the two station service buses is normally open.

EVENT DESCRIPTION:

On March 17, 2008 at approximately 1:00 PM while operating at 100%, a manual reactor trip was initiated due to the loss of steam generator (S/G) level. All control rods fully inserted and all safety equipment performed as designed. Auxiliary Feedwater automatic actuation occurred as required. The loss of S/G level was caused by the loss of the "B" Main Feedwater Pump [EIIS Code: SJ-P]. Subsequent to the trip, the Control Room received a report that a small wisp of smoke was seen coming from transformer XPB03. Electricians responded and noticed small puffs of smoke exiting the top of the secondary windings termination box of transformer XPB03. Troubleshooting determined that an AC line current protective relay had tripped. This specific relay senses overcurrent condition to the grounding resistors.

At the time of the failure, 4.16-kV busses PB03 and PB04 were cross-tied. The cross-tie had been established to allow scheduled testing on transformer XPB04. This condition results in all three Condensate pumps being supplied from the transformer XPB03. The plant trip was attributed to the failure of a secondary power cable from transformer XPB03 that resulted in the loss of all three condensate pumps subsequently losing all Feedwater Flow into the steam generators. Additionally, the loss of the buses PB03 and PB04 resulted in the loss of power to the Heater Drain Pumps, the Central Chiller Compressors, the Startup Feedwater Pump, and the Normal Charging Pump.

Transformer XPB03 had DOBLE testing performed on March 4, 2008 requiring the connections on the primary and secondary to be disconnected. The results of the transformer XPB03 DOBLE testing were satisfactory. There were no indications of transformer failure prior to DOBLE testing. Additional investigation into the equipment failure identified that a multi-conductor connector used to terminate the 1000 mcm cable to the secondary bushings was installed using the configuration for a 1500-2000 mcm cable size. Use of this configuration allowed the connector to bottom out before applying sufficient compression to the cable. The fit was snug, but not tight. The multi-cable conductor connector is designed to accommodate four ranges of cable size, from 4/0 to 2000 mcm. The specific cable size is marked on the inner saddle face that would be contacting the cable conductor(s).

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17. NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)*

In addition to being installed in the wrong configuration, the cross-tie arrangement of the busses was in place for approximately eleven hours. This condition resulted in a higher than normal current load being applied to the connection for an extended period of time. Together with the loose connection, the higher current caused overheating of the individual conductors and insulation resulting in a fault to ground.

BASIS FOR REPORTABILITY:

The reactor trip and subsequent actuation of Engineered Safety Features (ESF) described in this event is reportable per 10 CFR 50.73(a)(2)(iv)(A), which requires reporting of "Any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B) of this section." Paragraph (B)(1) of 10 CFR 50.73(a)(2)(iv) includes "Reactor protection system (RPS) including: reactor scram or reactor trip" and "PWR auxiliary or emergency feedwater system."

ROOT CAUSE:

The cause of the XPB03 incident was human error. The multi-cable conductor connector was not properly installed after DOBLE testing. The connector saddle size was too large for the conductor causing a loose connection when torque was applied. With higher than normal connection resistance and current load due to busses PB03 and PB04 being cross-tied, the conductor insulation became overheated and resulted in a fault to ground.

CORRECTIVE ACTIONS:

Work Orders were issued to inspect the other transformers that had similar connectors. Thermography was performed on the other transformers and no other indications of overheating were found.

DOBLE testing was re-performed on transformer XPB03 and associated bushings. There was no damage to the transformer other than the bushings and cable that were previously identified.

Personnel error issues were handled within station procedures.

SAFETY SIGNIFICANCE:

The loss of transformer XPB03 indirectly caused the Wolf Creek Generating Station to be manually tripped from 100% power. The safety significance of this event is low. This event is bounded by the current licensing basis analysis as reported in WCGS Updated Safety Analysis Report (USAR) section 15.2.7, "Loss of Normal Feedwater Flow." There were no adverse effects on the reactor core, the reactor coolant system, or the main steam system, due to the auxiliary feedwater system's capacity to supply the necessary heat sink. All safety related equipment performed as designed and there were no adverse effects on the health and safety of the public.

OPERATING EXPERIENCE/PREVIOUS EVENTS:

None